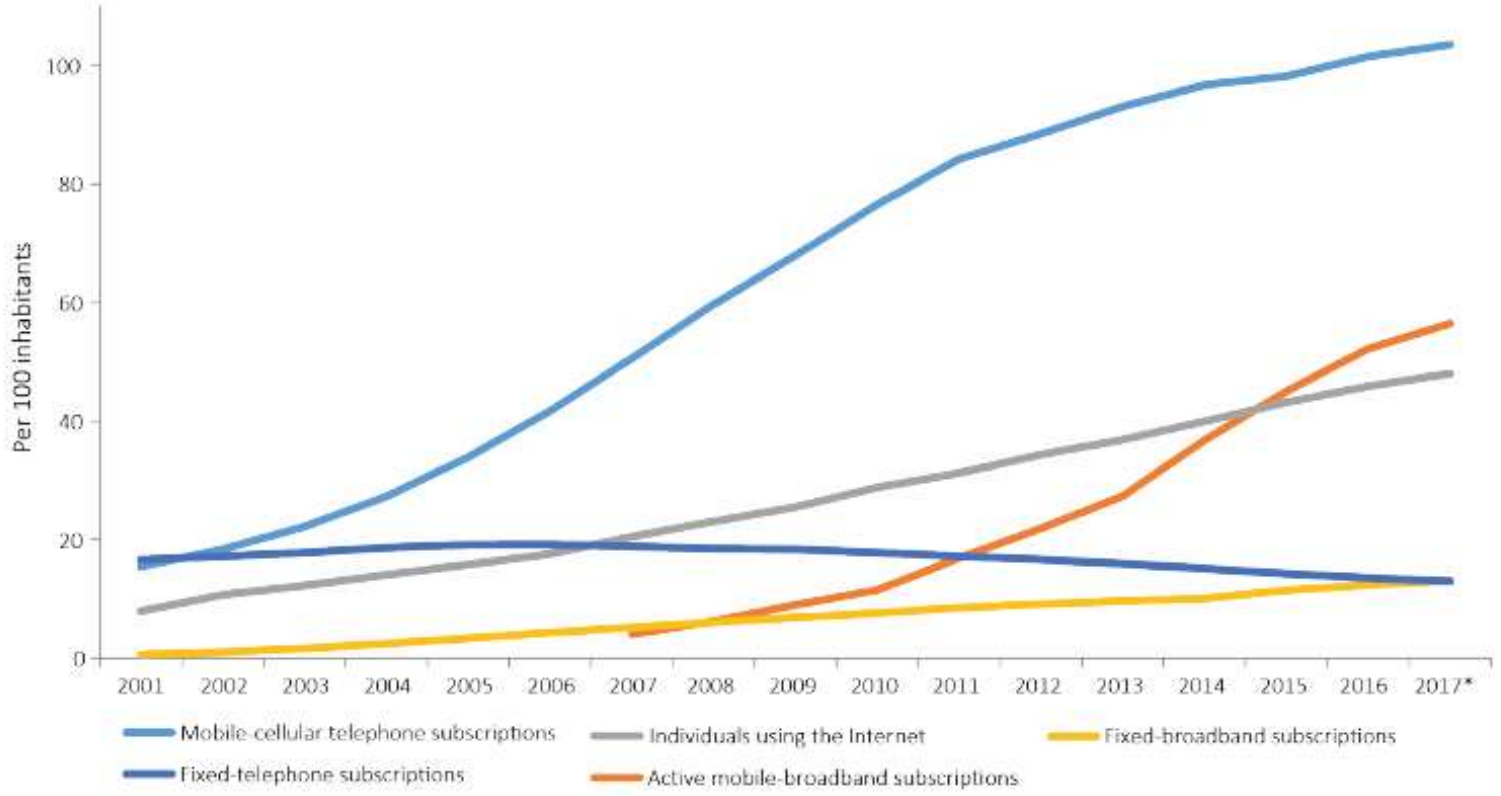
PacNOG-21

Migrating to IPv6 : Experiences from Asia-Pacific

Goals for a Sustainable Future : The SDGs

17 Sustainable Development Goals
and
169 Targets

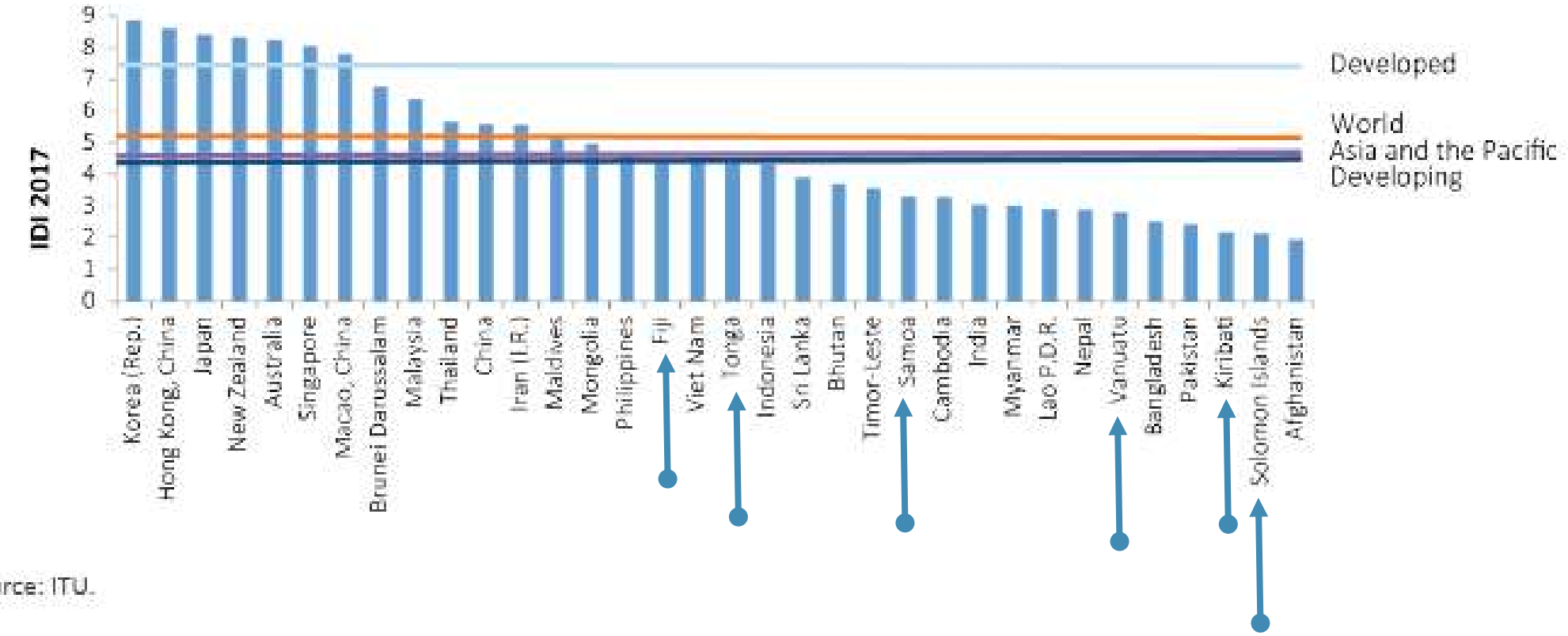


Notes: * ITU estimate.
Source: ITU.

Available for download at http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2017.aspx

Asia-Pacific has the greatest variation

Chart 3.7: IDI values, Asia and the Pacific, IDI 2017

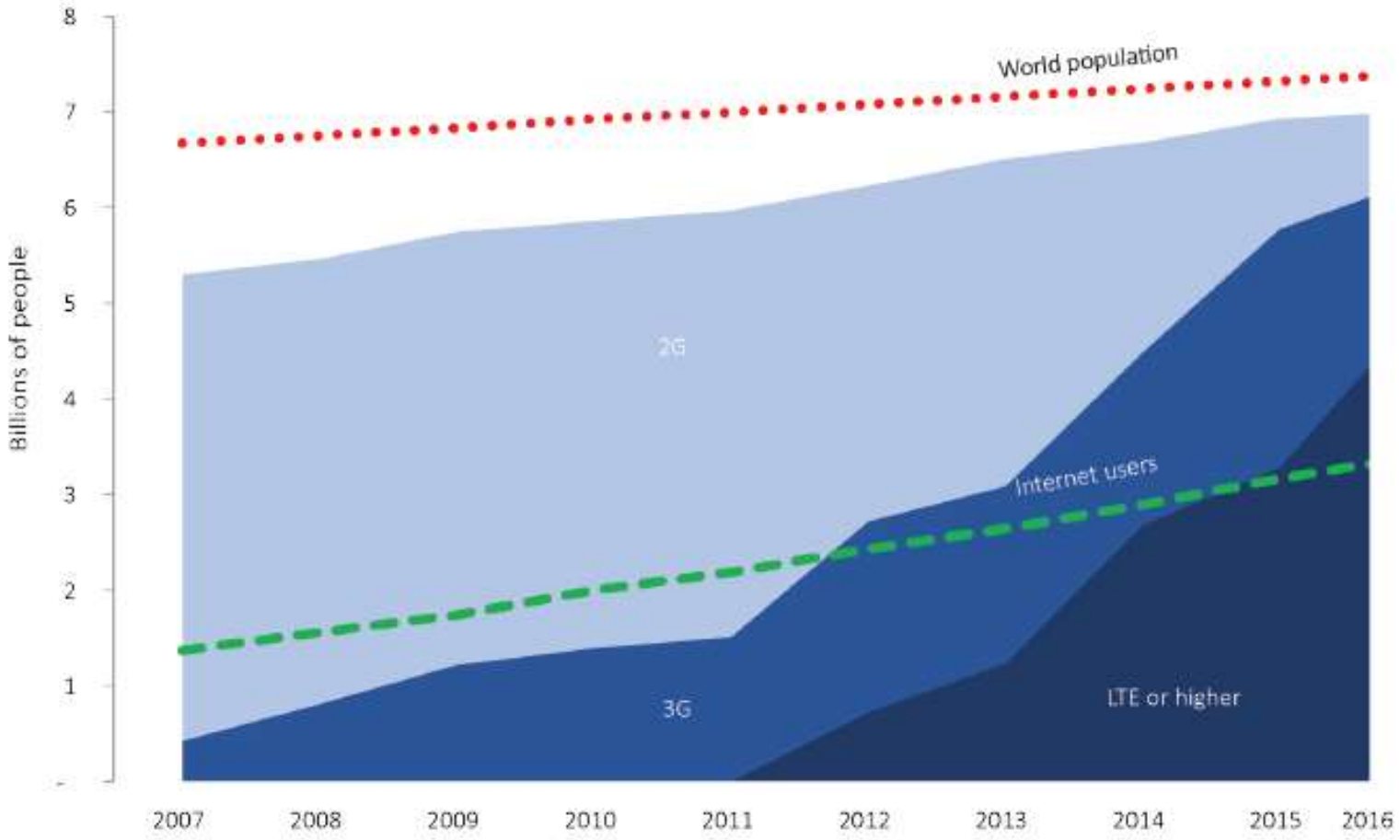


Source: ITU.

The most substantial average rate of improvement for any indicator in Asia and the Pacific was for mobile-broadband subscriptions. This indicator rose by an average 36.2 per cent between IDI 2016 and IDI 2017, with increases over 100 per cent, from very low baselines, in four countries (Samoa, Kiribati, the Lao P.D.R. and Afghanistan).

The second most substantial average rate of improvement (12.4 per cent) was for the proportion of households with Internet access, the highest improvements for which came from three LDCs (Bangladesh, the Lao P.D.R. and the Solomon Islands). All but one country in the region (Mongolia) recorded an improvement in this indicator.

Coverage of mobile-cellular networks in relation to world population and the number of Internet users (2007-2016)



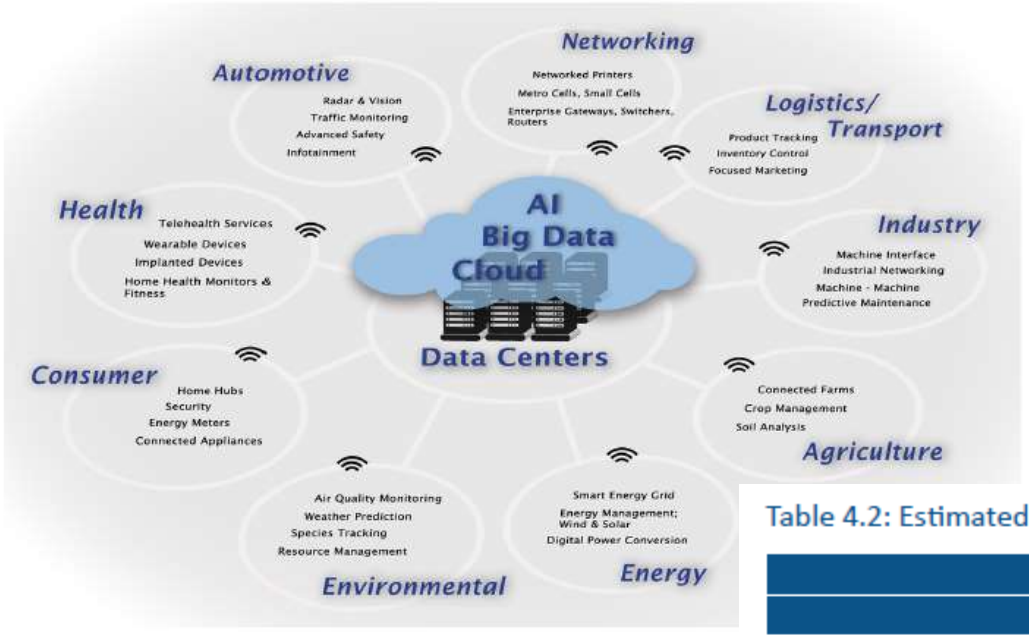
Source: ITU.

The number of subscriptions per 100 population has grown from 33.9 in 2005 to 76.6 in 2010, 98.2 in 2015 and an estimated 103.5 in 2017.

The number of subscriptions worldwide now exceeds the global population, with subscriptions also exceeding population in 112 of the 176 countries included in IDI 2017

IOT, Big Data and Artificial Intelligence – The new drivers of ICT ecosystem

Figure 4.1: IoT, cloud computing, big data and artificial intelligence – the new drivers of the ICT ecosystem



Source: ITU.

Table 4.2: Estimated global market sizes for selected advanced ICTs (USD millions)

	Estimated global revenues		
	2015	2020[a]	2025[a]
IoT[b]	193 500	267 000	640 000[c]
Big data[d]	27 300	57 300	88 500
Public cloud[e]	75 300	278 200	489 800
Artificial Intelligence[f]	644[g]	6 076	36 818

[a]Forecast. [b]Statista (2017b); Hunke et al. (2017). [c]Estimate based on expected compound annual growth rate. [d]Statista (2016, p. 22). [e]Statista (2017a, p. 13). [f]Kaul and Wheelcock (2016). [g]Information for 2016.
Sources: Statista (2016, 2017a, 2017b), Hunke et al. (2017), Kaul and Wheelcock (2016).

WTDC-17 : ITU-D OBJECTIVES AND ASIA-PACIFIC REGIONAL INITIATIVES

ITU-D OBJECTIVES 2018-2021

- Foster international cooperation and agreement on telecommunication/ICT development issues
- Modern and secure telecommunication/ ICT Infrastructure: Foster the development of infrastructure and services, including building confidence and security in the use of telecommunications/ICTs
- Enabling environment: Foster an enabling policy, and regulatory environment conducive to sustainable telecommunication/ICT development
- Inclusive digital society: Foster the development and use of telecommunications/ICTs and applications to empower people and societies for sustainable development

ASIA-PACIFIC REGIONAL INITIATIVES 2018-2021

- Addressing special needs of LDCs, SIDs including Pacific island countries and LLDCs
- Harnessing ICTs to support the digital economy and an inclusive digital society
- Fostering development of infrastructure to enhance digital connectivity
- Enabling policy and regulatory environments
- Contributing to secure and resilient environment

WTDC-17 RESOLUTION 63 (REV. BUENOS AIRES,2017)

IP address allocation and facilitating the transition to IPv6 deployment in the developing countries

……. *instructs the Director of the Telecommunication Development Bureau*

1 to continue the close cooperation and coordination with the Director of the Telecommunication Standardization Bureau in this regard, and to continue ongoing activities to facilitate the process of raising awareness on IPv6 deployment among all members, and to provide the necessary information on training and education activities;

2 to continue cooperating with relevant international and regional organizations, including the Regional Internet Registries (RIRs), on capacity building and the enhancement of technical skills for IPv6 in order to respond to the needs of developing countries;

3 to submit an annual report to the ITU Council on the progress made in this regard, and report to the next WTDC;

4 to develop guidelines, to enable, if necessary, adjustment of the organizational frameworks and policies necessary for migration to and deployment of IPv6,

……

ITU PLENIPOTENTIARY CONFERENCE 2014:
RESOLUTION 180 (REV. BUSAN, 2014 PP 2014): Facilitating the transition from IPv4 to IPv6
RESOLUTION 102

ITU-D STUDY GROUP 1

ASP RI 3: Fostering development of infrastructure to enhance digital connectivity

Objective: To assist Member States in the development of telecommunication/ICT infrastructure in order to facilitate provision of services and applications on that infrastructure.

Expected results:

1) Migration/transition of analogue networks to digital networks, application of affordable wired and wireless technologies (including interoperability of ICT infrastructure), and optimized use of the digital dividend;

2) Maximized use of new and emerging technologies for the development of telecommunication/ICT networks, including 5G and smart grid infrastructure and services

3) Strengthening of capacity to develop and implement national broadband plans in order to provide broadband access to unserved and underserved areas (including support for study of the status of national broadband networks and international connectivity), to promote affordable access, especially for youth, women, indigenous peoples and children, to select appropriate technologies, to develop and use universal service funds effectively, and to develop financially and operationally sustainable business models

4) Promotion of Internet exchange points (IXPs) as a long-term solution to advance connectivity, **deployment of IPv6-based networks and applications, and progress in the transition from IPv4 to IPv6**

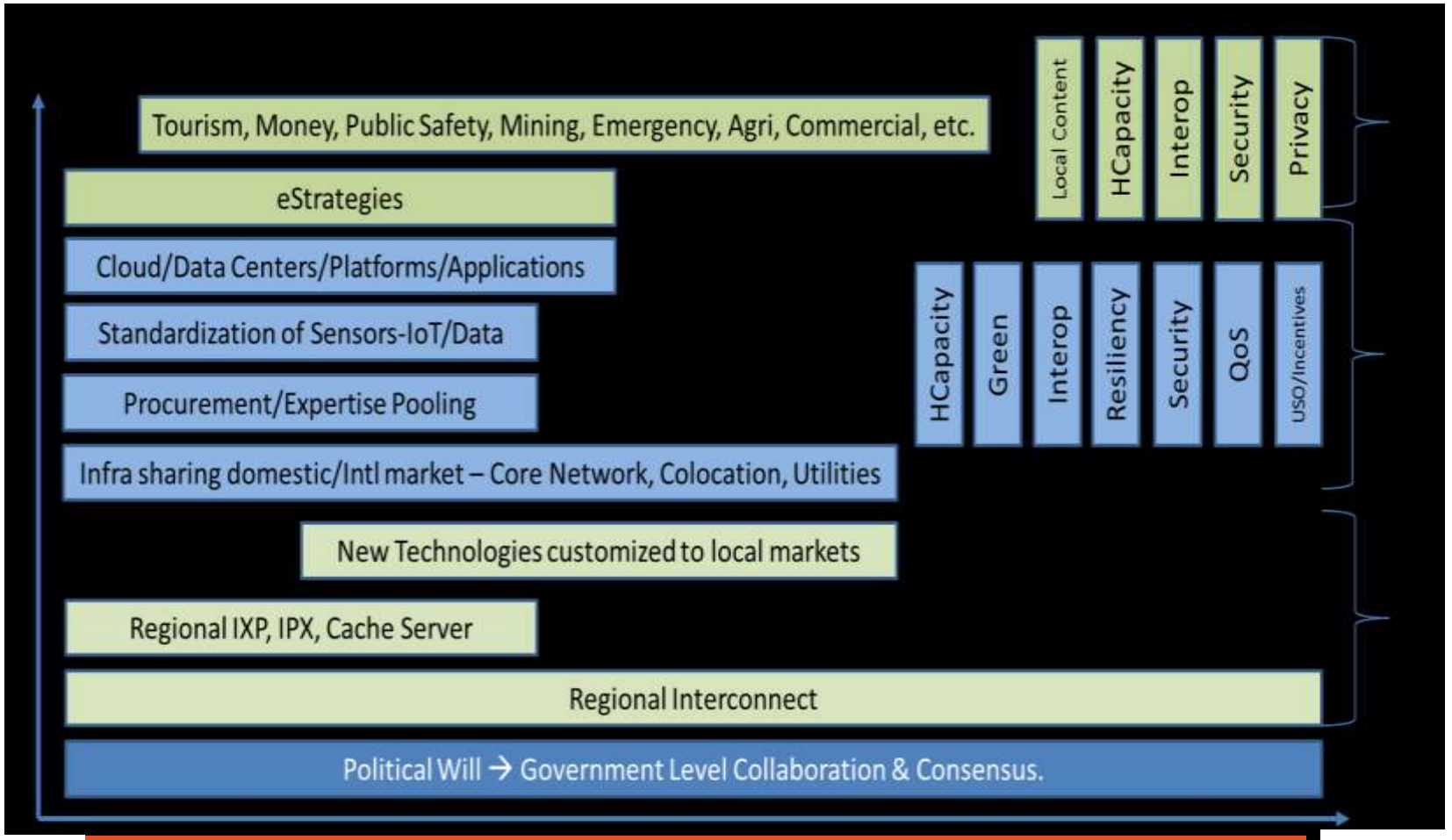
5) Strengthening of the capacity to implement conformance and interoperability (C&I) procedures and testing and to plan resources for C&I programmes, and facilitation of the establishment of common regional and subregional C&I regimes (including the adoption and implementation of mutual recognition arrangements)

6) Attention to spectrum-management issues, including radio-frequency planning, new spectrum-sharing approaches, harmonized spectrum allocation and spectrum monitoring systems, and support for preparations for world radiocommunication conferences (WRCs) and implementation of their outcomes

7) Building of skills for the development and use of satellite telecommunications

8) Strengthening of cooperation with international/regional organizations to enhance regional ICT connectivity, such as the Asia-Pacific Information Superhighway (AP-IS).

RECAP WORKSHOP : TELECOM IN THE PACIFIC- NEXT 5 YEARS ROADMAP



Source: ITU-PITA ASP CoE Workshop, 21-23 Nov 2017, Nadi, Fiji

Supported by

IPv6 migration : *The Why? questions of stakeholders*

Business continuity (esp. 4G, IoT)

IPv6 in IPv4 only network (Security risks)

Economic decision – Invest in IPv6 Vs Prolong IPv4

IPv6 is growing rapidly

Resources and best practices available

Policy and regulatory support

Convincing decision makers in stakeholders – A major challenge

Who are these stakeholders?

-Ministry, Regulatory authority, e-Government agencies, Telecom service providers, Content developers and providers, Standardization agencies, IP address allocation agencies, Development agencies, Academia and Training Providers, Telecom research organizations, Data centre providers, Internet exchange providers, Equipment importers, Type approval agencies, Enterprises with own networks, End Users ……..

Country experiences

Lao PDR

Cambodia

Annual (regional / sub-regional) training on IPv6 deployment and IPv6 Infrastructure Security 2011 onwards

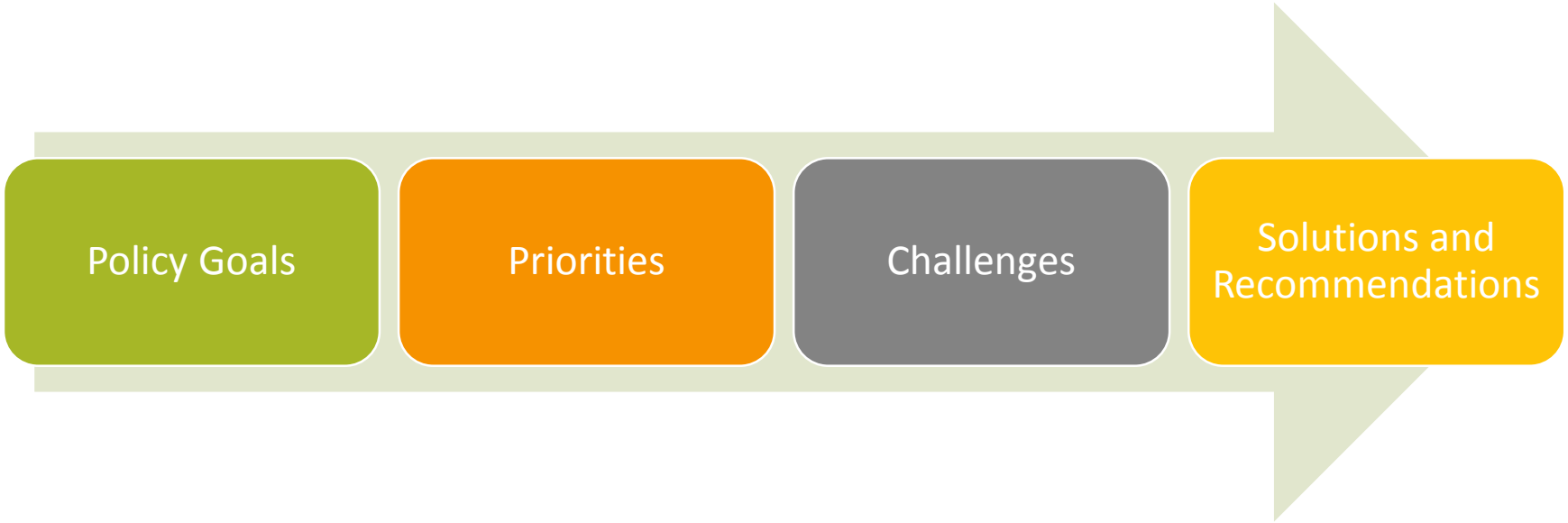
Mongolia

Bhutan

Specialized technical advice and training to countries and interested telecom operators

Recommendations on IPv6 deployment

IPv6 Roadmap Development



Key challenges

1. Policy, legislation, regulation and standardization issues
2. Institution, stakeholder engagement and coordination issues
3. Technology (hardware and software), infrastructure, and interoperability aspects
4. Security issues
5. Knowledge, awareness and skills issues
6. Procurement and financial issues

IPv6 migration - Experiences

Stakeholder engagement and stocktake

- *Current status and plans of government agencies and enterprises, telecom operators), content developers and device manufacturers on the status of IPv6 deployment and future plan*
- *Engaging stakeholders in a common dialogue*
- *Survey*

Policy, Task Force, Regulation and Roadmap

- *Include IPv6 adoption as part of the national telecommunication/ICT policy*
- *IPv6 task force*
- *IPv4 to IPv6 national roadmap*
- Standards and interoperability
- IXPs for IPv6 peering

Government leadership

- *Set deadlines for deployment of IPv6 within all Government Agencies and procurement processes*
- Monitoring mechanism

Telecom Industry and Business

- *Enterprise public facing content needs to support IPv6*
- *Start migration to IPv6 within their internal networks*
- *Recommendations /guidelines for IPv6 address plans*
- *Equipment which is type approved needs to be IPv6 capable as far as possible*
- *Prepare an implementation plan for IPv6 in their own networks*
- Transition technologies

IPv6 Security

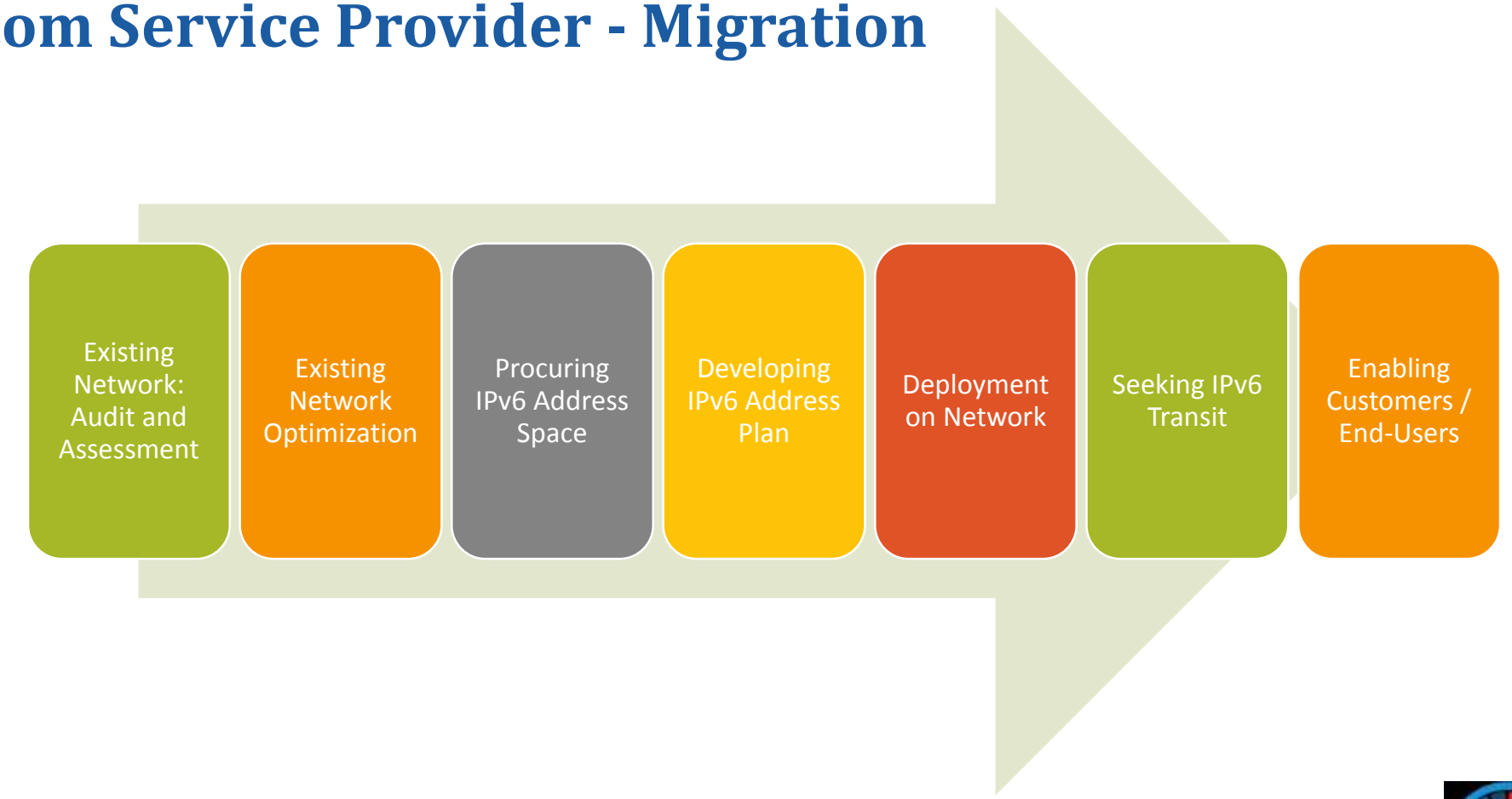
- *Develop an IPv6 Security Guideline in consultation with the IPv6 task force*

Human Capacity Building

- *Build human capacity on IPv6 transition mechanism including security*

Source: Roadmap assistances by APNIC and ITU

Telecom Service Provider - Migration



Source: Dr. Philip Smith, Roadmaps assistances by APNIC and ITU

Recommendation Categories

1. Recommendations applicable to all stakeholders
2. Recommendations relating to IPv6 deployment in government agencies
3. Recommendations relating to content and applications
4. Recommendations relating to Telecom service providers, CPE vendors, Data Centres and Enterprises
5. Recommendations relating to IPv6 security
6. Recommendations relating to customer awareness
7. Recommendations relating to institutional and individual capacity building

Thank You